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ABSTRACT

The purpose of this paper is to expose communication theorists to the concept of planning and to accentuate three specific types of scientific planning: dialectic, delphi, and participatory online. Divided into three sections, contents include a historical overview of the study of planning, which consists of definitions centering on the dualistic categorical system of prescientific and scientific planning; an inspection of the communicative implications resulting from the scientific techniques of dialectic, delphi, and participatory online planning, which are presented in correspondence with interpersonal and organizational communication implications; and a discussion of future communicative research needs. (Author/RB)

TOWARDS A COMMUNICATIVE THEORY OF ORGANIZATIONAL PLANNING

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ABSTRACT

The two-fold purpose of this paper is first, to expose to communication theorists the concept of planning. Planning I maintain is required for any situationally suitable transfer of information. And second, to accentuate three specific types of scientific planning: dialectic, delphi, and participatory online.

The composition of this paper is divided into three sections. First, an historical overview is given to the study of planning. Revealed are definitions centering on the dualistic categorical system of pre-scientific and scientific planning.

Second, communicative implications resulting from the scientific techniques of dialectic, delphi, and participatory online planning (POP) are inspected. Each of these are presented in correspondences with interpersonal and organizational communication implications.

And third, future communicative research needs concerning these three planning techniques are discussed.

TOWARDS A COMMUNICATIVE THEORY OF ORGANIZATIONAL PLANNING

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Planning has recently been the subject of much investigation and questioning. Isolated efforts concerning planning are evolving from most all academic disciplines. These efforts have begun to make evident that the activity of planning cross-cuts all subdivisions of human knowledge. In fact, today it is possible to observe individuals seeking to recognize planning not as a distinct activity limited unto a particular area of study, but rather as a science, applicable universally.

Given this perspective planning appears to bear direct relevance to communication studies. The actual phenomena of planning, where intrapersonal, interpersonal or noninterpersonal communication takes place is being subject to elementary but rapidly maturing empirical examination. The premis brought to this empirization holds that by testing the initial process where subjective assumptions are exposed to group interrogation, and plans are modeled, a greater degree of "success" will result. By coming to an understanding of the individual goal structures, attitudes, and decision making processes that a group of planners contains it is believed that better plans can be developed. That such information is within the realm of communication studies goes without question.

Traditionally communication theorists have placed little emphasis on the study of planning. Therefore the two-fold purpose of this paper is to (1) lay out some basic thoughts to communication theorists regarding planning, and (2) to accentuate three areas of scientific planning--dialectic, delphi, and participatory online--which seem to bear direct relevance to the study of communication. In order to do this a three part essay has been created. First, an historical perspective is given to the study of planning. Revealed here are definitions built around the dualistic categorical system of pre-scientific and scientific planning. It will be primarily seen that pre-scientific orientations limit their view to the actions resultant from interpersonal communicative planning sessions. From this perspective planning is considered as incapable of being subject to empirical verification. The second category of scientific planning focuses on the phenomena of planning as predictive of controllable future action. Within this light planning becomes susceptible to testing procedure.

Second, direct communicative implications resulting from the scientific techniques of dialectic, delphi, and participatory online planning are inspected. Each of these techniques will be seen to correlate planning with interpersonal and organizational communications.

And third, future implications fro communicative research concerning dialectic, delphi, and participatory online planning are discussed.

PRE-SCIENTIFIC DEFINITIONS OF PLANNING

The first perspective, or the pre-scientific outlook, claims that the phenomena of planning is an activity not susceptible to testing. Support for this position comes from individuals who limit their perception to future occurring actions which result from planning sessions. Unlike the scientific definitions of planning which are operative, pre-scientific definitions of planning are descriptive. Pre-scientific definitions show what action should

occur once planning takes place. They do not, like the scientific definitions show how that action is to be developed. For example, Scott [28:22] outlines a pre-scientific definition of planning in a five step approach:

1. Establish the objectives
2. Establish planning techniques
3. Seeking facts regarding possible courses of action
4. Evaluating alternative courses of action
5. Selecting a course (or courses) of action

He goes to great length to describe these five steps but he fails to mention how they may be most efficiently derived and maintained.

Another pre-scientific attitude was brought about by March and Simon. As summarized by Emery [10:110], they proposed that "plans, like computer programs, may be expressed in either procedural or declarative form." Procedural plans enumerate steps which are to be followed to culminate in a desired goal. And declarative plans consider merely the goal of planning itself, without any mention of the steps needed for attaining that goal. March and Simon also speak of the organizational hierarchy and the constraints imposed by different decision making levels during the formulation of plans. But once again, they offer little criticism concerning how procedural or declarative plans are to develop.

Branch [3:10-11] writes of three descriptive types of planning. "Functional planning--planning a component or aspect of a larger endeavor . . . project planning--a combination of facts recognized and unrecognized uncertainties, limited investigation, and trial and error . . . a diverse body of progressive knowledge and experience . . ," and, a combination of both functional planning and project planning, "comprehensive planning . . . the ultimate in man's endeavor to perform a major achievement, shape his environment, or effect his future. . . . What we are concerned with in comprehensive planning is the spectrum of human awareness, knowledge, capacity to consider and act."

Koontz and O'Donnel [19:74-78], like March and Simon, primarily describe planning in terms of goals. They believe that a plan should lead to behavior that brings about desired outcomes. In a procedural fashion they then go on to state that goals can be achieved by formalizing a plan which explicates modes of action, outcomes of that action, and methods of transferring information to individuals to perform the action.

For Steiner [32:41] planning is ". . . a process which begins with objectives, defines strategies, policies, and detailed plans to achieve them; establishes an organ to implement decisions; and includes a review of performance and feedback to introduce a new planning cycle."

From a business context Emery [10:88-142] isolates planning as synonymous with the operations of management. The affirmation is made that planning is located within the organizational hierarchy. Courses of action are initiated at top levels and diffuse down through formal channels. Emery sees the key steps in the planning process as "assembling data, constructing a model, developing alternative plans, evaluating consequences of the alternatives, selecting the best plan, implementing the plan, and controlling the plan in operation."

In another effort to grasp the meaning of planning Robert Ayers [2] mentions an analytical approach composed of three types of planning. They are (1) policy planning; the formulation of alternative goal patterns,

(2) strategic planning; the formulation of a set of laternative routes for achieving a chosen set of goals, and (3) tactical planning; or the delineation of the sequences of action necessary to implement a particular strategy.

In an extended description definition, Peter Drucker states that planning is

> a continuous process of making present entrepreneurial decisions systematically and with best possible knowledge of their futurity, organizing systematically the effort needed to carry out these decisions, and measuring the results of those decisions against expectations through organized systematic feedback. [9:238-249]

Bertrand de Jouvenel [7], one who upholds the position that planning is to be forever locked within the pre-scientific domain, is interpreted by Sackman [27:8] as saying "that planning is not concerned with 'true or false', but with the 'realm of the possible.'" Even though Sackman does acknowledge de Jouvenel's

> capture (of) the contemporary mood of planning . . . when he insists that the increasing tempo of change implies a decreasing life expectancy of present knowledge, which, in turn, requires more intensive planning at more frequent intervals. Increasing planning can compensate, at least in part, for growing uncertainty. [27:8]

The convergence of these descriptive, pre-scientific definitions offers little methodology on which to test the degree of success that a planning process may attain. By turning now to the scientific realm, the possibility to witness testable planning procedures presents itself.

SCIENTIFIC DEFINITIONS OF PLANNING

The scientific outlook places major emphasis on the phenomena of planning where group and individual assumptions concerning possible courses of future action are initially exposed. The supporters of this position maintain that if communication, when involved in decision making, is studied as a scientific event, then that communication should be susceptible to rigid emperical verification.

Given direction by the British urban planners, George Chadwick [5] and J. Brian McLoughlin [22], scientific definitions now argue that in order for plans to be open to careful inspection they should be considered as hypotheses. By hypothesis they refer to the ability to prognosticate possible courses of action under speculative conditions. Sackman defends this position but qualifies his belief in terms of the object system which a particular plan must operate within. An object system is composed of two dynamic forces which constrain the operations of a plan. The first force is the system setting, or the internally controllable mechanisms within an organization. And the second force, the ecosystem, or the external environmental forces which surround the organization. For example, any organizational concern would partially consider its object system to be composed of first, internal operations such as production schedules, employee morale, etc. And second, the organization would also be concerned with external forces such as national economic developments, labor negotiations, etc. Sackman argues that limited in this way

> plans could be working hypotheses concerning system performance subject to continued test and evaluated throughout the life cycle of the object system. [27:43]

With this crucial orientation to the development of plans as limited by the object system Sackman formulated the following definition.

> Planning refers to the plastic evolving hypotheses concerning system objectives and performance in specified environments, including embedding ecosystems, to achieve desired levels of operationally defined effectiveness, within stated resources, throughout the life-cycle of the object system and successor systems. [27:45]

This definition reveals seven major points which appear to require further explanation.

1. Plans are considered as hypotheses. By hypotheses Sackman refers to the prediction of "consequences in accordance with specified relations among operationally defined variables." [27:42]

2. Plans are placed within an evolving system context. That is, plans become dynamic instead of static.

3. Plans are operationally defined thereby maintaining limits on the dynamic nature of the systems operations.

4. Plans operate within an object system. An object system is composed of two subsystems, first, the system setting, or the internally controlled mechanisms of the object system, and second, the ecosystem, or the external environmental factors of the object system.

5. Plans should be regarded as pliable human creations subject to temporal and resources constraints.

6. Plans operate in a real world. They are not subject to laboratory sterility.

7. Plans require continued testing and modification to insure success.

Of paramount importance, then, is the recognition that plans should be considered as hypotheses, subject to continual testing within the dynamic object system it is contained in.

Miller et al. further emphasized the necessary testability of plans by stating that

> Planning can be thought of therefore as requiring the construction of a list of tests which must be performed; we have an image of a desired outcome and from this we can determine the conditions for which we must test, and these tests, arranged sequentially, provide the strategy for a possible plan. [5:24]

ORGANIZATIONAL COMMUNICATIONS AND SCIENTIFIC PLANNING

SCOPE

In retrospection, the assumption this paper stresses is that any situationally suitable transfer of information requires some prior operation of planning. During this section I wish to lay emphasis on what "situationally suitable transfer of information" means.

Barry Rosove [25] sought to resolve the problem of information transfer in planning by attempting to discover what techniques are most successful or "situationally suitable." Rosove designed and collected twenty-one methods in which he believed scientific planning would thrive. To the list of twenty-one, Sackman added five more to sum the total to twenty-six planning categories. (These categories are defined in Appendix 1.) Rosove rated his initial list of twenty-one through a common scale which consisted of:

1. Generation of alternative
2. Exploration of alternative futures
3. Exploration of consequences of decisions
4. Potential for informed public dialogue
5. Training potential
6. Amenability to research
7. Identification of research needs. [24:22]

By weighting the scales equally Rosove came to a composite rating for his categories. Sackman similarly rated his supplementary five and placed them onto Rosove's compilation. (The rank order of these categories is found in Appendix II.)

Each of the twenty-six techniques offers its own advantages and disadvantages toward the discovery of "best" plans in a particular situation. There are however two techniques on Rosove's list which appear to bear direct relevance to communication studies. They are dialectical planning and delphi planning. A discussion of these, along with participatory online planning (POP), a technique that Sackman placed major stress on and I see to be a combination of dialectical and delphi planning, will be presented below.

DIALECTICAL PLANNING

Dialectical planning is defined as the

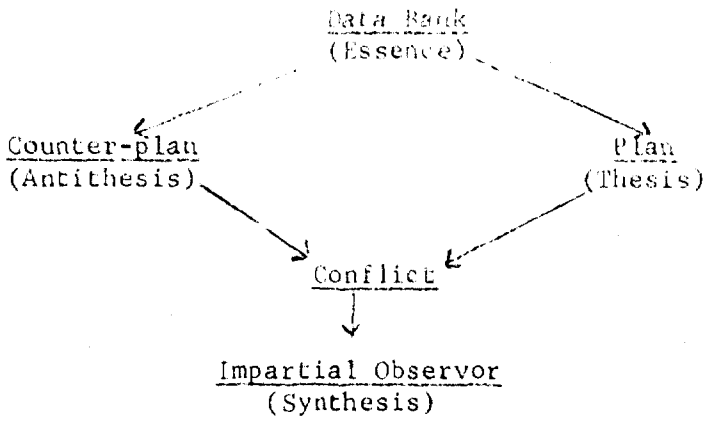
> Generation of an opposing set of "best" plans representing conflicting values and views, followed by structured debate, using the same data base until the data bank is exhausted, performed by opposing advocates for management. [27:21]

Manifest in much the same form as Plato portrayed the famous Socratic exchanges, this technique is today advocated as one method of scientifically testing plans. Mason [24], patterning dialectic planning after Hegel's [12] interpretation, sees this form of planning as proceeding through three fundamental stages.

First, data bank information (essence) is presented to both the plan (thesis) and the counter-plan (antithesis).

Second, the plan and the counter-plan confront each other on [illegible]

Third, an impartial observor of the conflict integrates opposing theses and forms a new view of the situation (synthesis). This process is shown below.



Mason argues that through the establishment of opposing argumentative bases individuals are forced to make clear-cut decisions concerning the positions they defend. It is then believed that these decisions further the competitive display of the assumptions on which the opposing arguments base themselves. "Quite often the result is that a new alternative is generated, based on those assumptions from the previous two plans which prove to be the strongest." [24:B-410] In a summarizing fashion Mason says that

> A system may be said to be dialectical if it examines a situation completely and logically from two different points of view. The dialectical approach begins by identifying the prevailing or recommended plan and the data which were used to derive it. The question is posed: "Under what view-of-the-world is this the 'optimal' plan to follow?" This results in sets of plausible and believable assumptions that underly the plan. That is, they serve to interpret the data so as to logically conclude that this plan is best for achieving the organization's goals.
>
> In order to test the assumptions underlying this plan a search is initialed to find another plausible and believable alternative and the counterplan. [24:B-403-404]

Cady [4:167-196] has listed seven qualifying controls to ensure successful dialectical planning. They are:

1. The right questions must be asked in order to get the most meaningful results.

2. The approach taken within the dialectic may often have to be modified and restructured to achieve the best results.

3. All assumptions which underlie a position should be made visible.

4. The recognition of uncertainty should be explicitly dealt with.

5. Time considerations relating to information, object movement, and cost fluxuation are significant.

6. A testing of the validity of the information with relevant questions must take place.

7. Communications may be required from the levels in the organization which will actually be carrying out the plans under scrutiny in the dialectic sessions. Inputs from the implementation groups should be received when necessary.

Although unclear in many aspects, dialectical planning surely holds fruitful avenues of future research for communication theorists. As one of Mason's participants summarized,

> It (the dialectic presentation) structures creativity by stimulating thought. The two well developed points of view pull you both ways at the same time. You begin to ask yourself "How can we get the best of both?" It becomes the vehicle for amalgamating the best plan you know how to develop. [24:B-411]

DELPHI PLANNING

The second scientific planning technique is the delphi method. Delphi is defined by Sackman as:

> A precedure for systematically soliciting and collating the opinions of experts on the future of a pre-selected subject by sequential individual interrogation, usually by questionnaire. An effort is made to achieve consensus or convergence by the feedback of results to the participants. [27:18]

The purpose of the delphi technique is to gain a highly educated opinion thereby attempting to govern a certain area of conflict. Skutsch and Schofer, in following Dalkey's [6] lead, state that the

> Three basic principles which attempt to explain why Delphi works are as follows: (1) group judgments are superior to individual ones; (2) anonymity allows greater rationality; (3) group pressure acts to consolidate group opinion. [30:307-8]

Named after the famous oracle in ancient Greece, the delphi technique is today constructed via computer. The computer facilitates a "sequential individual interrogation" of expert opinion from widely dispersed localities. Helmer [13, 14, 15] qualifies an individual's expertness as "his degree of reliability," or

> . . . the relative frequency of cases in which, when confronted with several alternative hypotheses, he ascribed to the eventually correct alternative among them a greater personal probability (sic) than to the others. [14:14]

In order to clarify the procedure used to solicit expert opinion an example is paraphrased from H. Kilen and K. L. Citrenbaum's article "Interest Management Planning." [18:273-278] Take Mr. A, the chairman of a corporation which has a problem. In efforts to alleviate the problem the corporation uses to utilize the delphi technique. The first step involves the gathering of perspective experts through a screening process from a computerized personnel file. This file contains the names and area of specialization of a conglomerate of individuals. Mr. A records the names of those experts most likely to be able to assist his corporation in their problem. Then with a statement describing the problem Mr. A submits to a central computer his list containing all the individuals that the screening process revealed. Each of the persons are then notified as to this action by computer.

Given the particular dimensions of the problem situation, the next step pertains to the notified experts judging their own eligibility. All of the individuals are asked to respond affirmatively or negatively as to their participation. This response is then sent back to the central computer. Also at this time experts contacted may submit additional names they feel as eligible in dealing with Mr. A's problem.

Once having selected and obtained all available experts Mr. A's task is then to present a detailed model of the problem in its totality. All experts are encouraged to critically inspect and readjust the formulation of the model as they deem necessary. It is intended that in this way an authentic replication of the problem may be attained. If the experts make any adjustments on the model they are sent back to Mr. A. with reasons why such adjustments were made. Mr. A has the prerogative of either accepting or rejecting the alterations applied to his original model. If, however, he accepts any model adjustments a revised description must be reissued to all participants.

When the appropriate model has been devised the experts are notified to submit their problem solution opinions to Mr. A. After all opinions have been gathered, a report is disseminated graphically displaying each participants rank among his fellow experts. Once accomplished, a second submission of opinion may be taken to narrow any major variance of opinion expressed on the first trial. "It has been shown that a consensus can be obtained with a few iterations of this process." [18:270]

Helmer [14] points out that four advantages exist from this type of interactive communication. First, the formulation of the problem model acts as a communicative control for both Mr. A and the experts. Second, the experts' own knowledge may be combined through the memory bank of the computer so that relevant information, which may not have been previously attained, may be made available. Third, due to the linkage of the computer all experts can profitably interact with each other concerning the problem. And fourth, it is most interesting to note that through the delphi technique of scientific planning interpersonal communication is, for all practical descriptions, eliminated. Helmer sees this as

> further reducing the influence of certain psychological factors, such as specious persuasion, and the unwillingness to abandon publicly exposed opinions, and the bandwagon effect of majority opinion. [13:40]

PARTICIPATORY ONLINE PLANNING (POP)

The third area of scientific planning Participatory Online Planning (POP). Once again Sackman defines.

> Participatory planning refers to mutual expectations in social creation of a plan--the attitudes, beliefs, goals, priorities, judgments, and supporting rationalizations that enter into social consensus for defining and initiating an authorized plan. Research in participatory online planning (POP) refers to systematic experimentation in the creation of plans as expressed in planning consensus in an online computing environment. [27:52]

This general description can be formulated into the following five subdivisions. First, expectation theory is cited by Sackman within POP as a way of interpreting the "problem-solving process of planning." [27:49] Within a social framework planning is an attempt to prepare individuals for future conflict. If proper interpretation of that conflict takes place, then the "problem-solving process of planning" may proceed. In this way preparation is made for the members of a society to gain appropriate expectations. Especially with the logarithmic acceleration of contemporary change broad social expectation is required to make practical the employment of plans. As witnessed through political and institutional processes, most social efforts plan for future activities by following group expectational norms. The goal of POP is to appropriately conform plans to the expectational norms of a social group.

Second, it is during the initial stages of group consensus that POP focuses its attention. During the germination stage of planning social sanction will always develop in some positive or negative fashion. As a group seeks to direct its own social change an effort to achieve consensus is observed. The attainment of group expectation during the formulation stages of planning "concerning social values, goals, resources, alternative courses of action, and priorities" [27:50] normally yields predictable behavior during future activities.

Third, POP operates within an adversary information system. Adversary information systems are replicable to the dialectic technique mentioned above which attempt to reveal basic assumptions that opposing groups may possess through rigorous questioning. The major difference which separates the two, however, is that where dialectical planning operates largely in an interpersonal domain, POP exploits the non-interpersonal workings of the computer to gain social consensus for a plan. All arguments concerning a particular course of future action are related to, and recorded by, the computer. Through constant re-organization and updating of data the computer is able to supply a detailed and accurate picture concerning alternative plans of action.

Fourth, Sackman argues that POP is a highly conducive environment for educational improvements for future directed activities. He writes,

> If planning is in fact a type of learning experience, it should be explicitly supported and designed as an educational tool. Since POP is an online planning system, it should have available an online facility to support interactive construction of plans, selective presentation of textual material, tutorial support, and real-time tracking and measurement of planning performance against specified criteria. The educational aspects of planning should be systematically exploited to improve planning skills and the quality of end-item plans. [27:55]

At present there is no customary way of testing an individual's proficiency in the task of planning. Through the cultivation of the educational experience of POP possibilities are increased for establishing methods of measuring, defining, and tracking computer used planning facilities.

And fifth, POP presents the possibilities of creating planning communities. These communities would be composed of individuals physically remote, but in communication with one another through computer. Similar in this way to the delphi technique, planning problems should be more readily approached and solved by engaging expert opinion extending over a wide range of skills and interests.

In summary, POP is a computerized planning environment which offers "an ideal way to very rapidly collect and disseminate diverse opinions and rationale behind such opinions . . ."

POP supplies a recognition of expectation theory which works toward the prediction and control of human behavior. POP strives for this prediction and control by conforming to the majority opinion of a particular social group's desires.

An adversary information system, which seeks to expose conflicting ideas, is brought to the fore. The assumption here underlying is that from this action the "best" set of plans will eventually result.

The use of the computer within POP magnifies man's ability to record information transpired within a planning situation. This will enhance the capacity of future planners to review past occurrences so to support their own decision making.

And, educational benefits to increase critical planning abilities should be seen.

This completes the description of the three scientific planning techniques of dialectic, delphi, and participatory online planning (POP). Within the final section I hope to uncover future areas of communicative research as inspected through the study of planning.

FUTURE RESEARCH NEEDS

DIALECTICAL PLANNING

Due to group interaction through which dialectical planning proceeds, research must necessarily place emphasis on the interpersonal communicative situation. Studies of planning in this light must concentrate not only on intrapersonal communicative thought operation, but also importance should be given to the interpersonal socialized communications. McDougal goes so far as to

> define planning in relation to social action rather than thought processes. For planning is a particular form of social decision making. It involves decisions being made about the physical, economic, and social structure . . . [21:79-90]

One fruitful avenue now open to communication theorists involved with social decision making and planning is the group shift phenomena. The unclear forms of interpersonal pressures that exist in group activity need to be more clearly categorized. [16]

Along with the intra and interpersonal communicative situation, theories of planning should also include descriptions of the "structural context and ideological framework" [21:84] in which planning decisions are made. The structural context of a planning situation is defined as "the distribution of power and wealth within the socio-economic structure . . ." [21:82] and idealogical framework is defined as "the political idealogies leading to the generation of particular types of planning;" [21:84] For example, research conducted in the United States has attempted to come to certain general

conclusions pertaining to appropriate decision making methodologies. It might be important to recognize the democratic forces which have fostered the pursuit of this research, and the possible developments that may have occurred under another governmental establishment.

Subsequent to an understanding of the idealogies and structural constraints offered planners are questions put forth by Michael S. Silvester [29]. He considers it important to know

> who plans, and why they are in this position, and what are the goals, and who defines them, and how are they defined? (sic) [26:95]

Like McDougal he alludes to the notion of power structures as probably being the prominent factor in effecting any decisions a planner makes. He further states that "who takes the decision qualifies what decision is taken." [29:98]

And finally, procedures for establishing clear goals for planners in the interpersonal dialectic situation should be constructed. Methods need to be devised which will categorically aid planners in obtaining "best" results.

With these points in mind, I see the following four questions arising.

1. Viewing dialectical planning as an interpersonal communicative situation; What, if any, group thought processes can be utilized so to devise "best" plans? And, what, if any, individual thought processes can be utilized so to devise "best" plans?

2. In our political and organizational institutions; Who are our planners? Are they successful? and if yes, why? How is that success measured? What is the structural context and idealogical framework which these planners operate within?

3. How can the group shift phenomena be profitably employed to better understanding the planning process?

4. How are goal structures to be most clearly formalized in planning and pre-planning exercises? What methods can be used to allow an individual to recognize exactly what goals he needs to accomplish, and to be able to see those goals clearly when he has created them?

DELPHI PLANNING

In relation to future research Delphi planning offers a unique situation in that it eliminates interpersonal communication. This elimination is assumed by Helmer [13, 15] to be beneficial to the planning environment. One possible line of research might attempt to investigate the non-interpersonal phenomena to discover if Helmer is correct.

One noticeable drawback to the delphi technique is the impersonal attitude created in submitting opinion through computerized questionnaire. Communication empiricists might attempt to investigate the consequences this procedure may have on experts who are often called upon to submit their opinions.

The successive trials of the delphi technique reveal a marked trend toward group shift. The non-interpersonal communication of delphi planning could be placed in complementary relation to the group shift phenomena in hopes of gaining a comparison. For example Skutsch and Schoffer [30] indicate that

Studies in the effects of inter-round feedback in the Delphi, however, show that, despite anonymity, a strong pressure to conform exists. [30:308]

Helmer suggests the following as areas for future research:

> improvements in the systematic selection of experts: experimentation with various schemes for respondents to give a self-appraisal of competence, either absolute or relative to that of their fellow respondents: methods of improving reliability of forecasts through suitable consensus formulae, possibly based on appropriate self-ratings; experimentation with various methods of feeding back information, in order to learn more about the sensitivity of opinion changes to both the form and content of such feedback; comparative analysis of social pressure and persuasive reasoning as determinants of opinion convergence; formulation of a statistical model of the question-and-answer operation of an expert panel, in which the latter would be viewed as a measuring instrument for the substantive quantities which form the subject of the questions . . . ; development of techniques for the formulation of sequential questions that would probe more systematically into the underlying reasons for the respondents' opinion, in a deliberate effort to construct a theoretical foundation for the phenomena under inquiry. [15:45]

Acknowledging these thoughts concerning the delphi technique, the following points are formulated:

1. As a method of attaining expert opinion, what are the long-term effects of the computerized questionnaire that the delphi method must proceed to operate?

2. What is the correspondence between the group shift phenomena in the interpersonal setting as compared to the non-interpersonal occurrence?

3. Can non-interpersonal and interpersonal communication be placed on a metaphorical continuum, as it were, so as to delimit their boundaries?

4. Given direction by Helmer's extensive knowledge on the delphi technique, the reader is referred to the passage quoted above for a more inclusive source of research questions.

PARTICIPATORY ONLINE PLANNING

Because POP combines the qualities of both dialectical and delphi planning the questions mentioned above will also apply to this operation. However, POP does extend beyond the previously discussed techniques in the following five ways.

First, mutual expectation theory, central to any socially communicative situation requires further clarification. The role of reinforcement theory as concerned with consensus in group goals, resources, social values, etc., is also in need of expanded prognosis.

Second, POP accentuates the early, creative stages of the planning process. Research is needed here to better investigate the time and energies spent in seeking to create efficient plans.

Third, the adversary information system where opposing ideas develop in order to aid in the clarification of planning technique lacks complete understanding.

Fourth, the use of the widely separated planning communities as seen in the delphi technique required further speculation. The effects physically dispersed individuals may have on the concrete development of plans is not as yet entirely known.

And fifth, the educational involvement of POP needs improved cultivation. The use of POP as a teaching technique toward the development of perspective plans requires added energies.

Questions relating to the above areas may be:

1. What are the general information patterns found within the dialectic and delphi planning situations so that they may more properly be applied to POP?

2. How can the early creative stages of planning mature so as to yield more efficient plans? How can goals be most properly formulated?

3. What is the relationship between mutual expectation theory and group planning experience?

4. How is it possible to determine whether groups are cohesive at early stages? And if this knowledge can be developed, what are some necessary steps that can be taken to alleviate non-cohesiveness?

5. Seen as an educational tool, how can POP expand its teaching abilities to make known general categories suitable for study in the development of plans?

APPENDIX I

Definitions:

Brainstorming: A form of group dynamics designed to encourage creative and imaginative thinking about the future via an uninhibited exchange of ideas.

Delphi Technique: A procedure for systematically soliciting and collating the opinions of experts on the future of a pre-selected subject by sequential individual interrogations, usually by questionnaires. An effort is made to achieve consensus or convergence of opinion by the feedback of results to the participants.

Expert Opinion: The opinions of qualified specialists about the future of the phenomena within the field in which they have renown or the recognition of their peers.

Literary Fiction: Novels or other forms of literature which imaginatively or creatively construct future social systems or conditions.

Scenarios: The imaginative construction into the future of a logical sequence of events based on specified assumptions and initial conditions in a given problem area.

Historical Analogy: Inferring the similarity between attributes or processes of two or more different historical developments, social conditions, or societies on the basis of other presumed similarities.

Historical Sequences: Formulations of the independent recurrence of similar sequential social, economic, and cultural processes and conditions in different societies or nations; or the treatment of socio-cultural phenomena, in general, in terms of logico-historical sequential phases or stages of development.

Content Analysis: Abstracting from content--speeches, novels, art forms--generalizations or trends pertaining to a wide range of phenomena such as public attitudes, values, political ideology, national style, etc.

Social Accounting: An effort to conjecture about the future of a nation, social system, or institution by determining the "sum" of a series of independent factors, a, b, c, . . . n which comprise it at time t, resulting in profile A, and then progressing to series a', b', c', . . . n' at time t', resulting in profile B.

Primary Determinant: The interpretation of sociocultural events, conditions, and processes in the past, present, and future in terms of the consequences of a single major factor or primary determinant such as Marx's mode of production or McLuhan's media.

Time-Series Extrapolation: The extension of a series of measurements of a variable over a period of time from the past into the future.

Contextual Mapping: The extrapolation in graphic form of the interrelationships of functionally related developments. A "map" shows logical and causal interdependencies.

rphological Analysis: A systematic procedure for exploring the totality of all possible solutions to a given large-scale problem, e.g., all possible ways propelling rockets. The definition of the problem provides an initial set of parameters, and the full range of possible answers to the problem inherent in each initial parameter represent another set of parameters, and this set is then explored, and so on, until all the parameters have been exhausted. A possible solution to the problem of propelling rockets may then be any combination of the dependent parameters within the sets of parameters at different levels of the analysis.

Relevance Trees: A procedure for determining the objective means or techniques required to implement an explicit qualitative goal; e.g., to permit all students to proceed through educational programs at their own pace. Each branch point of the tree, moving downward from the stated objective, represents a potential decision to follow a particular implementation direction. Either qualitative or quantitative criteria, or both, may be used to aid the selection process. Each subsequent branch level is considered, in turn, as a possible set of alternative goals, and each alternative is analyzed to determine the objective means required to implement it.

Decision Matrices: A method for allocating resources, determining priorities, or selecting goals by graphically displaying the relationships or multiple interdependent variables in two or three dimensions. For example, one dimension of a decision matrix in education might be available funds while the other dimension might be faculty and administrators/ salaries, maintenance costs, library costs, etc.

Deterministic Models: A deterministic model is a mathematical abstraction of real-world phenomena. It is a set of relationships among quantitative elements of the following types: parameters, variable inputs, and variable outputs. The development of computer technology has made possible the implementation of models which are too complex for noncomputerized solutions.

Probabilistic Models: A probabilistic model is a mathematical representation of the interactions among a number of variables in which the value of at least one variable is assigned by a random process. The numerical results of repeated exercises of the model will yield different numerical values. The values of variables may be based on estimates of future conditions. A computer facilitates running many exercises with the model.

Gaming: (Not to be confused with game theory.) Provides a simulated operational present or future environment structures so as to make possible multiple simultaneous interactions among competing or cooperating players. Games may be entirely manual in nature, or a computer may be used in some types of games to provide inputs to players, and to record their performances.

Operational Simulation: The exercising of operators of a system in their actual environment by the use of selected simulated inputs to provide education and training to the system's operators and/or to facilitate analysis and understanding of the system's operations for evolutionary design and development. The inputs may represent the world of the future.

Benefit-Cost Analysis: A quantitative method designed to assist decision makers to make the most efficient tradeoffs between financial resources and competing programs. The total cost of each program, both direct and indirect, is estimated, and the programs may be evaluated in terms of the advantages, outputs, or results (benefits), both short-run and long-run, which each is estimated to have. These estimates are expressed quantitatively. Since both program costs and their benefits have specific values, several alternative courses of action may may be systematically compared and evaluated.

Input/Output Tables: Models of an economy which is disaggregated into sectors and in which explicit account is taken of sales and purchases between sectors. One set of parameters which is common to all such models is technical coefficients; the technical coefficients of an industry are the number of units of input of each industry which are required in order to produce one unit of output of the given industry.

Dialectical Planning: Generation of an opposing set of "best" plans representing conflicting values and views, followed by structured debate, using the same data base until the data bank is exhausted, performed by opposing advocates for management.

PERT/CPM: Program Evaluation and Review Technique using Critical Path Method analyses; the analytic portrayal of costs, manpower, and schedules in graphic form in terms of activities and milestones for an object system to achieve planning objectives within specified resource levels.

PPB: Planning, Programming, and Budgeting; technique introduced by DOD and used extensively in other government agencies since 1965; required systems analyses of agency objectives, definition of a five-year plan, cost-effectiveness analyses of proposed programs, with annual updating of plans and budgets for the five-year projection, and continuing assessment of programs.

Normative Planning: Also referred to as teleological planning; deliberate and critical examination of the fundamental value judgments underlying planning goals, prior to and distinguished from strategic planning for working toward specified goals, and tactical planning to achieve defined goals.

Confrontation Techniques: This category includes a broad class of techniques involving some element of involuntary external coercion of individuals or groups to change individual traits, group policies, or plans by some form of social confrontation; e.g., psychodrama, T-groups, sensitivity training, Synanon game, intervention in professional meetings, marches, strikes, and "sit-ins."[45]

APPENDIX II

Rank	Methods
1	Gaming
2	Operational Simulation
3	Delphi Technique
4	Deterministic Models
5	PERT/CPM
6	Probabilistic Models
7	PPB
8	Scenarios
9	Dialectical Planning
10	Social Accounting
11	Expert Opinion
12	Normative Planning
13	Decision Matrices
14	Relevance Trees
15	Confrontation Techniques
16	Brainstorming
17	Benefit-Cost Analysis
18	Input-Output Tables
19	Time-Series Extrapolation
20	Morphological Analysis
21	Contextual Analysis
22	Content Analysis
23	Primary Determinant
24	Historical Analogy
25	Historical Sequences
26	Literary Fiction

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